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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,272	04/02/2001	Hyun-doo Shin	Q59549	7285

7590 10/15/2004

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EXAMINER

HUNG, YUBIN

ART UNIT PAPER NUMBER

2625

DATE MAILED: 10/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,272

Applicant(s)

SHIN ET AL.

Examiner

Yubin Hung

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment/Arguments

1. This action is in response to amendment received on June 29, 2004.
2. Claims 1-13 are still pending.
3. Examiner acknowledges receipt of a certified copy of application #2000-48323 filed in the Republic of Korea on August 21, 2000 and the clarification that this is the only foreign application of which foreign priority is claimed under 35 U.S.C. §119(a)-(d).
4. The replacement drawing for Fig.1 indicated in the 06/29/2004 amendment has not been received. Applicant is required to re-submit the replacement drawing.
5. Applicant's arguments filed 06/29/2004 have been fully considered but they are not persuasive. Therefore, the 35 USC § 103 rejections to claims 1-13 are maintained. See below.
6. **In remarks Applicant argued in substance:**

Regarding claims 1, 7, 12 & 13:

- 7.1 *that the present invention **requires** one or more feature vectors to be concentrated in one or more cells and that hierarchical indexing is performed*

only when such cells exist; and further that Kothuri does not disclose such a feature vector space nor the existence of concentrated cell(s). (P. 4, lines 9-14.)

However, the claims only require **determining** whether concentrated cells (i.e., cells that contain a minimum number of feature vectors; per lines 11-13, where the number is 10, of the application) exist; they do not require their existence. Therefore this argument is not valid.

7.2 *that Kothuri does not disclose determining whether feature vectors concentrate in cells (P. 4, last line) and that Kauri's determining steps are significantly different from the applicant's. (P. 5, lines 6-13.)*

However, Kothuri discloses determining the existence of such concentrated cells in Fig. 5, numerals 506 and 516. [Note that each multi-attribute data is considered a feature vector and that the cell (i.e., a node) capacity determines whether a cell is concentrated or not.] Moreover, the claims only recite determining the existence of concentrated cells and as stated above, Kothuri performs this function; therefore, there is no difference between the two.

7.3 *that Kothuri repeatedly divides sets (of feature vectors) into subsets until each subset can fit into a leaf node (i.e., none exceed the node capacity) and that this is different from determining the existence of concentrated cells and not the same as concentrating feature vectors into clusters. (P. 5, lines 14-17.)*

However, as stated above, Kothuri discloses determining the existence of such concentrated cells in Fig. 5, numerals 506 and 516. Moreover, the claims do not require concentrating feature vectors into clusters; instead, they merely require determining the existence of such clusters (i.e., cells). Therefore, this argument is not valid.

7.4 *that Kothuri cannot provide finer indexing. (P. 5, lines 21-23.)*

However, this limitation is not claimed and therefore the argument is not valid.

Regarding claim 3:

7.5 *that Massen does not suggest using the histograms to determine if one or more cells where one or more feature vectors are concentrated exist. (P. 6, last line – P. 7, line 2.)*

However, Massen teaches analyzing histograms to determine whether the frequency of a bin (i.e., a cell) is too small (or equivalently, large, or concentrated, since it inherently involves comparing with a threshold). Therefore, this argument is not valid.

7.6 *that all other claims should be allowed because they depend directly or indirectly from claims 1 or 7.*

Art Unit: 2625

However, this argument is moot since the rejections of claims 1 and 7 are maintained.

Claim Rejections - 35 USC § 102

(From the first office action)

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 7, 12, 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kothuri et al. (US 6,381,605).

Regarding claim 1, Kothuri et al. discloses

(a) Determining whether one or more cells, on each of which one or more of said plurality of feature vectors are correspondingly concentrated, exist
[Fig. 3; Fig. 5, numerals 506, 518; Col. 14, line 55 – Col. 15, line 43]

(b) Hierarchically indexing the feature vector data space when it is determined that said one or more cells, on each of which said one or more of said plurality of feature vectors are correspondingly concentrated, exist in the step (a).
[Col. 3, lines 27-37; Col. 14, lines 55-56]

3. Claim 7, being a medium claim of claim 1, is similarly analyzed and rejected.
4. Regarding claim 12, Kothuri et al. further discloses using nearest neighbor query to conduct search [Col. 19, lines 30-39]. Therefore, claim 12 is rejected per claim 1 and the additional disclosure recited above.
5. Claim 13 is similarly analyzed and rejected as per claim 12.

Claim Rejections - 35 USC § 103

(From the first office action)

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of "2n-Tree Classifiers" in IBM Technical Disclosure Bulletin, Vol. 34, No. 4B, September 1991, pp. 225-228 (hereinafter referred to as IBM-TDB).

Art Unit: 2625

8. Regarding claim 2, Kothuri et al. discloses everything except the following, which IBM-TDB teaches

- further comprising a step of (pa-1) partitioning the feature vector data space into a plurality of cells, including said one or more cells, having a uniform size, before the step (a)
[P. 1, Disclosure Text: lines 13-20]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using uniform partition as taught by IBM-TDB since this type of partitioning (e.g., quadtrees, hypercubes) are well known in the art and efficient implementation is readily available.

9. Claim 9, being a medium claim of claim 2, is similarly analyzed and rejected.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of Massen (US 5,809,165).

11. Regarding claim 3, Kothuri et al. discloses everything except for the following, which Massen teaches:

- Constructing a histogram illustrating a number of said plurality of feature vectors in each of a plurality of cells, including said one or more cells;
[Fig. 2A; Col. 2, lines 11-16; Col. 4, lines 3-10. Note that each histogram "bin" corresponds to a cell]

Art Unit: 2625

- Analyzing a distribution of said plurality of feature vectors using the histogram and determining whether said one or more cells, on each of which said one or more of said plurality of feature vectors are correspondingly concentrated, exist. [Fig. 2B; Col. 4, lines 29-32]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using the histogramming and thresholding techniques taught by Massen to identify the existence of cells with a concentration of feature vectors since such techniques are well known in the art and efficient implementation is readily available.

12. Claims 4-6, 8, 10, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) as applied to claims 1, 7, 12, 13 above, and further in view of "A Quantitative Analysis and Performance Study for Similarity-Search Methods in High-Dimensional Spaces," *Proceedings of the 24th International Conference on Very Large Data Base*, New York, August 1998, pp. 194-205 (Hereinafter referred to as Weber et al.).

13. Regarding claim 4, Kothuri et al. discloses everything except for the following, which Weber et al. teaches:

- The indexing method of claim 1, wherein the step (b) comprises the step of indexing the feature vector data space using a vector approximation file [Section 4.1, lines 1-13]

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kothuri et al. by using VA-file for indexing as taught by Weber et al. in order to overcome the indexing difficulty resulted from increased dimensionality of the feature space.

14. Claims 5 and 6 are similarly analyzed and rejected as per claims 1 and 4 since Kothuri et al. discloses recursive partition of cells in Figure 5 and Weber et al. teaches approximating the data points (i.e., feature vectors) that fall into each cell with the corresponding VA-file in lines 5-8 of Section 4.1.

15. Claim 8, being a medium claim of claim 4, is similarly analyzed and rejected as per claim 4.

16. Claim 10, being a medium claim of claim 6, is similarly analyzed and rejected as per claim 6.

17. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kothuri et al. (US 6,381,605) and Weber et al. as applied to claims 4-6, 8, 10 above, and further in view of Massen (US 5,809,165) (as applied to claim 3).

Art Unit: 2625

Regarding claim 11, it is a medium claim for the combined method of the methods recited in claims 3-5, respectively, and is therefore similarly analyzed and rejected as per claims 3-5.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
October 5, 2004



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